

IN THE CLAIMS:

Please cancel without prejudice Claims 1-15, 28 and 29. Claims 16-25 remain pending in the application and Claims 16, 26 and 27 have been amended.

Please add the following newly drafted Claims 30-40.

1-15. (Cancelled)

16. (Amended) A method of forming a transparent multi-layer coating over a substrate comprising:

forming a surface-hardening layer over said substrate;

forming a multi-layer abrasion-resistant coating over said surface-hardening layer by sequentially depositing a plurality of alternating layers of silicon dioxide and zirconium dioxide of respectively different thicknesses over said surface-hardening layer using a dry coating technique; and

depositing a hydrophobic coating over said abrasion-resistant coating using a dry coating technique.

17. (Original) The method of claim 16, wherein said abrasion-resistant coating and said hydrophobic coating are dry coatings which are formed by a vacuum deposition technique.

18. (Original) The method of claim 16, wherein said abrasion-resistant coating is formed to sequentially comprise a silicon dioxide layer, a zirconium dioxide layer, a silicon dioxide layer, a zirconium dioxide layer, and a silicon dioxide layer.

1 19. (Original) The method of claim 18, wherein said abrasion-resistant coating is
2 formed to sequentially comprise a silicon dioxide layer of approximately 907 angstrom, a
3 zirconium dioxide layer of approximately 765 angstrom, a silicon dioxide layer of approximately
4 174 angstrom, a zirconium dioxide layer of approximately 246 angstrom, and a silicon dioxide
5 layer of approximately 2616 angstrom.

1 20. (Original) The method of claim 16, wherein said hydrophobic coating comprises
2 perfluoroalkylsilane.

1 21. (Original) The method of claim 20, wherein said perfluoroalkylsilane coating is
2 formed to have a thickness of approximately 5-20 nm.

1 22. (Original) The method of claim 16, wherein said hydrophobic coating and said
2 abrasion-resistant coating have substantially equal thermal coefficients of expansion.

1 23. (Original) The method of claim 16, wherein said surface-hardening layer is an
2 organo-silicon polymer material.

1 24. (Original) The method of claim 23, wherein organo-silicon polymer material is
2 triethoxymethyl silane.

1 25. (Original) The method of claim 23, wherein said organo-silicon layer is formed
2 to have a thickness of approximately 2-3 microns.

1 26. (Amended) The method of claim ~~1~~ 16, wherein said coating is formed on a glass
2 substrate.

1 27. (Amended) The method of claim 1-16, wherein said coating is formed on a
2 polymer-based substrate.

1 28-29. (Cancelled)

1 30. (New) A method of forming a transparent multi-layer coating over a transparent
2 plastic substrate to provide abrasion-resistant and hydrophobic properties comprising the steps
3 of;

4 providing a transparent plastic substrate;

5 forming an organo-silicon tie-bond layer on the plastic substrate;

6 forming a multi-layer abrasion-resistant coating of alternating layers of silicon
7 dioxide and zirconium dioxide over the tie-layer wherein a thickness of a first layer adjacent the
8 tie-layer is larger than each respective subsequent layer; and

9 depositing a hydrophobic coating over the abrasion-resistant coating with a dry
10 coating technique wherein the thicknesses of each layer and corresponding thermal coefficients
11 of expansion cooperate to match a thermal coefficient of expansion of the plastic substrate over
12 an operative predetermined thermal range.

1 31. (New) The method of claim 30 wherein the hydrophobic coating is
2 perfluoroalkylsilane.

1 32. (New) The method of claim 31 wherein the tie-bond layer is a triethoxymethyl
2 silane.

1 33. (New) The method of claim 30 wherein the thickness of each alternating layer of
2 the abrasion-resistant coating is different.

1 34. (New) The method of claim 33 wherein the sum of the combined thicknesses of
2 the silicon dioxide layers are at least three times greater than the sum of the combined
3 thicknesses of the zirconium dioxide layers.

1 35. (New) The method of claim 30 wherein a thickness of an outside layer of the
2 abrasion-resistant coating is larger than any intermediate layer after the first layer.

1 36. (New) A method of forming a transparent multi-layer coating over a transparent
2 plastic substrate to provide abrasion-resistant and hydrophobic properties comprising the steps
3 of:

4 providing a transparent plastic substrate from one of polycarbonate and acrylic;

5 forming an organo-silicon tie-bond layer on the plastic substrate;

6 forming a multi-layer abrasion-resistant coating of alternating layers of silicon
7 dioxide and zirconium dioxide over the tie-bond layer wherein a thickness of a first layer
8 adjacent the tie-bond layer is larger than each respective subsequent layer; and

9 depositing a perfluoroalkylsilane coating over the multi-layer abrasion-resistant
10 coating of sufficient thickness to make the plastic substrate hydrophobic, wherein the thicknesses
11 of each layer and corresponding thermal coefficients of expansion cooperate to match a thermal
12 coefficient of expansion of the plastic substrate over an operative predetermined thermal range.

1 37. (New) The method of claim 36 wherein the tie-bond layer is triethoxymethyl
2 silane.

1 38. (New) The method of claim 37 wherein the thickness of each alternating layer of
2 the abrasion-resistant coating is different.

1 39. (New) The method of claim 38 wherein the sum of the combined thicknesses of
2 the silicon dioxide layers is at least three times greater than the sum of the combined thickness of
3 the zirconium dioxide layers.

1 40. (New) The method of claim 39 where a thickness of an outside layer of the
2 abrasion-resistant coating is larger than any intermediate layer after the first layer.